Oroville Cold Water Pool Analysis

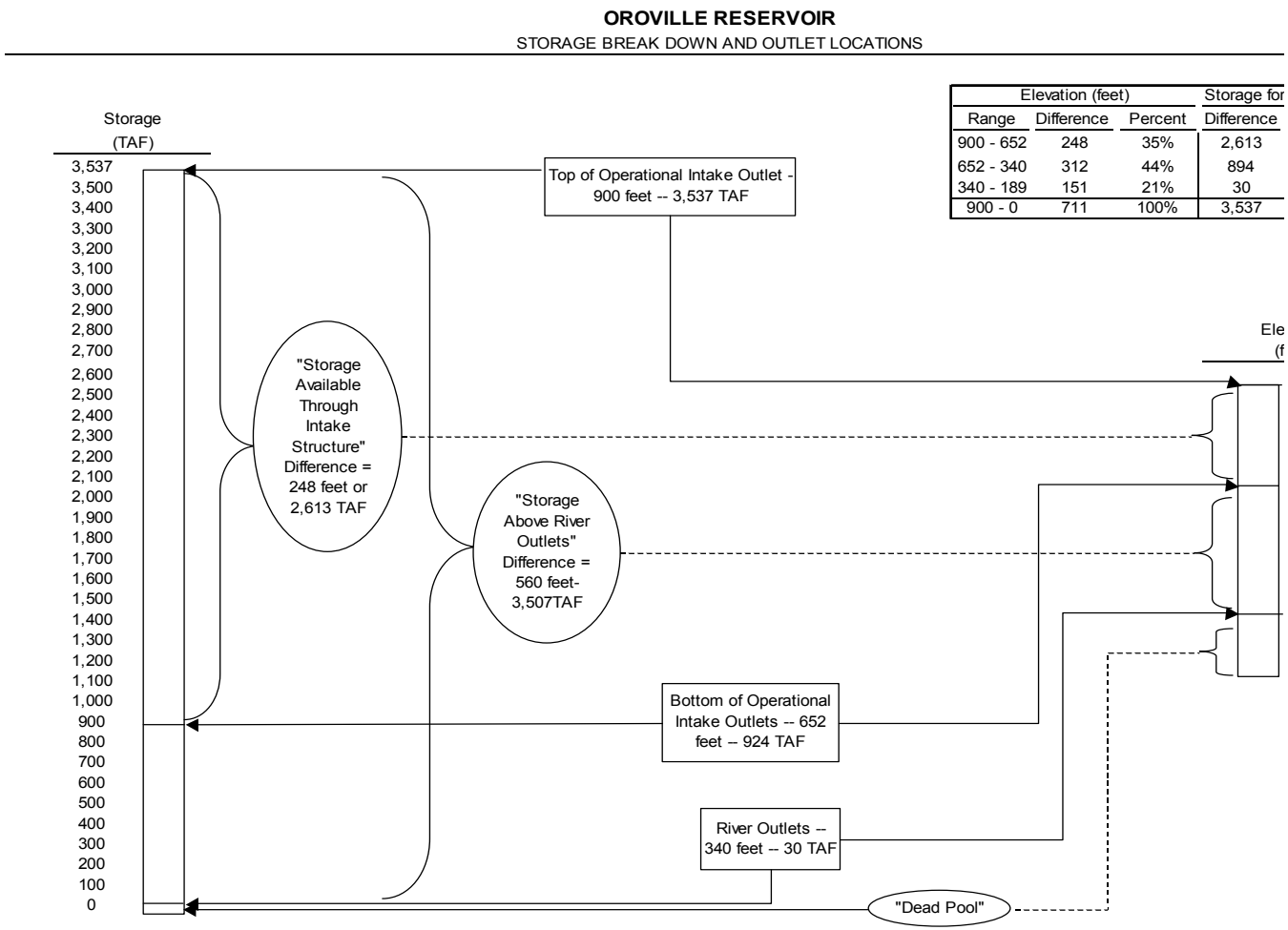
Purpose

- Develop information on availability of cold water in Oroville Reservoir
- Use best available models and simulations for the analysis

Major Assumptions

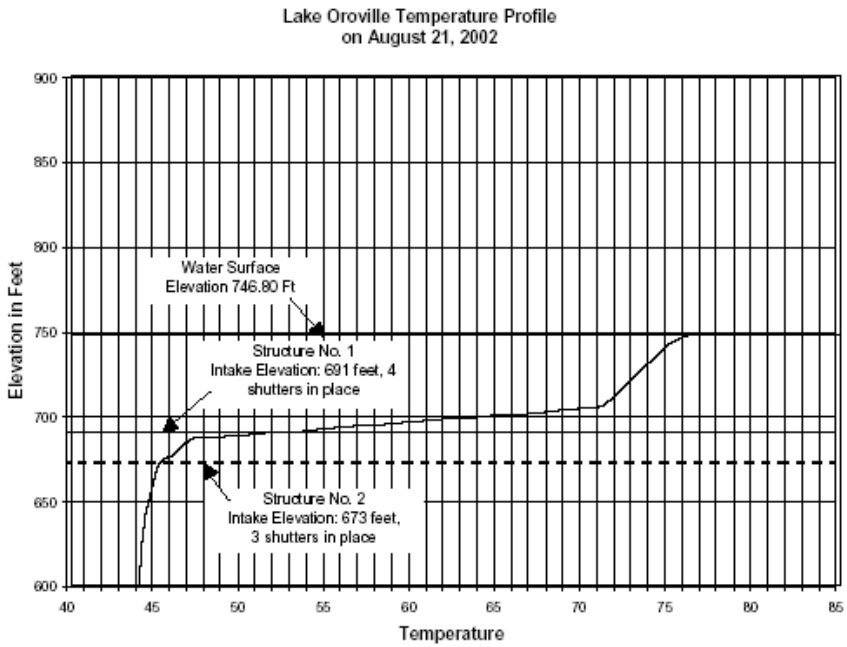
- Use existing PROSIM existing and future level simulations for operational data
- Use USBR monthly mean temperature model for temperature analysis
- Use 55 F as target for cold water pool and outlet release temperature

Oroville Storage Classification



Sample Oroville Temperature Profile

Table 7. Oroville-Thermalito Complex
Water Temperature Data
(in degrees Fahrenheit)
August 2002



Note: Water surface elevations on Table 4 are taken at Oroville Dam at midnight and may differ slightly from those shown on this table which are normally taken at mid-day and upstream from Oroville Dam.

PROSIM Simulations

- Used because appropriate CALSIM simulations were not available
- Selected existing and future level benchmark simulations with assumptions similar to anticipated CALSIM simulations
- The selected simulations have been used as benchmarks in a number of impact analysis purposes and have been reviewed and accepted.

Oroville Temperature Model

- Uses operational data from PROSIM
- 1-D model
- Monthly time step
- Accepted model with history of use with PROSIM simulations
- Simulation available for selected PROSIM simulations

Procedure

- Reviewed existing temperature simulations
- Modified release temperature targets as required for this analysis
- Re-ran the temperature simulations
- Extracted reservoir temperature profiles for each month
- Performed analysis of the data

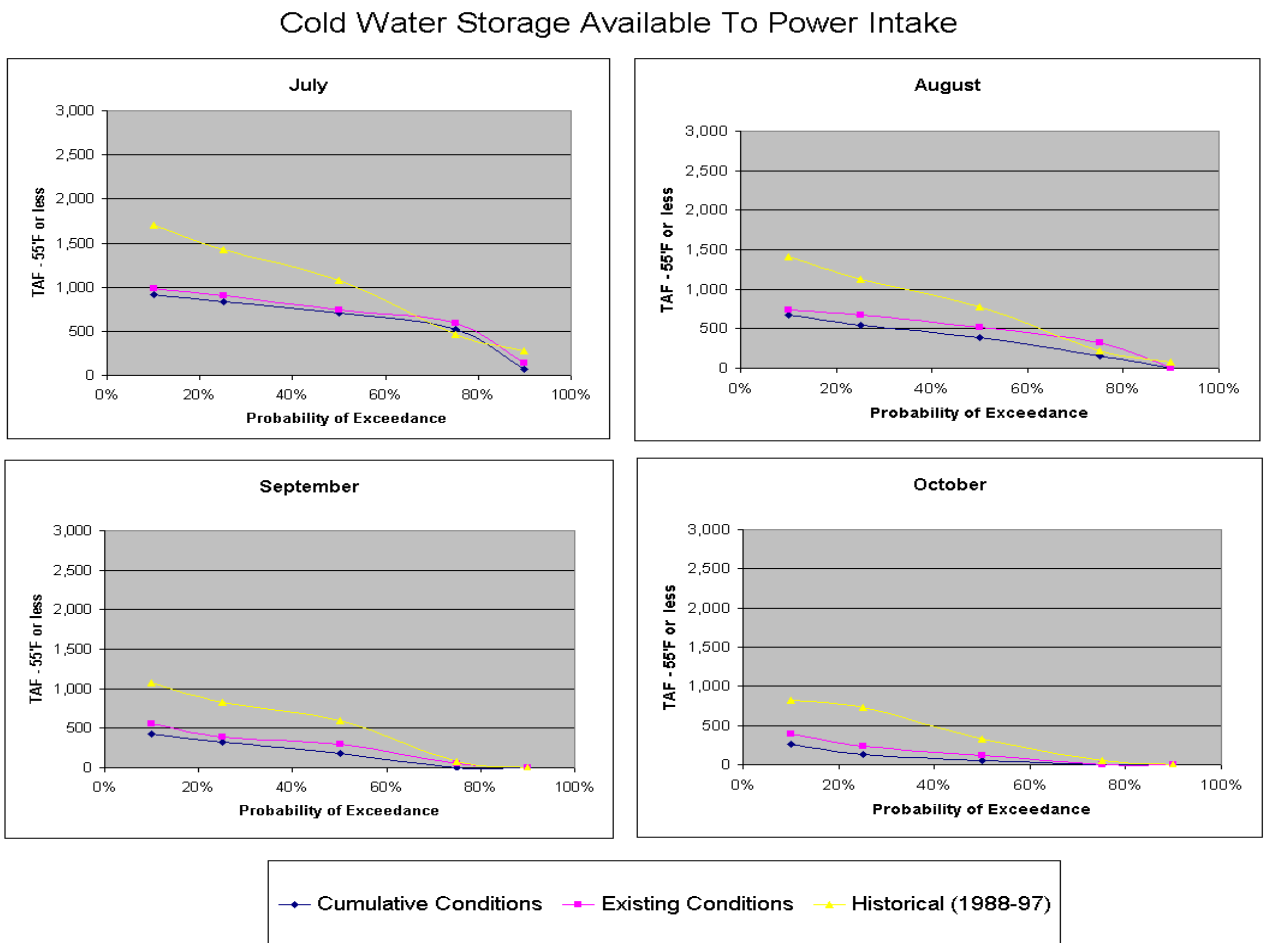
Release Temperature Targets

	1983 DWR/CDFG Agreement	Existing USBR modeling	Modified for this Analysis
Jan	55	47	47
Feb	55	46	46
Mar	55	47	47
Apr	51	49	49
May	51 / 55 *	53	53
Jun	56 / 60 *	55	55
Jul	60	59	55
Aug	60 / 58 *	58	55
Sep	52	53	53
Oct	51	52	52
Nov	51	52	52
Dec	55	49	49
* First number applies to first half of month, second number applies to second half of month.			

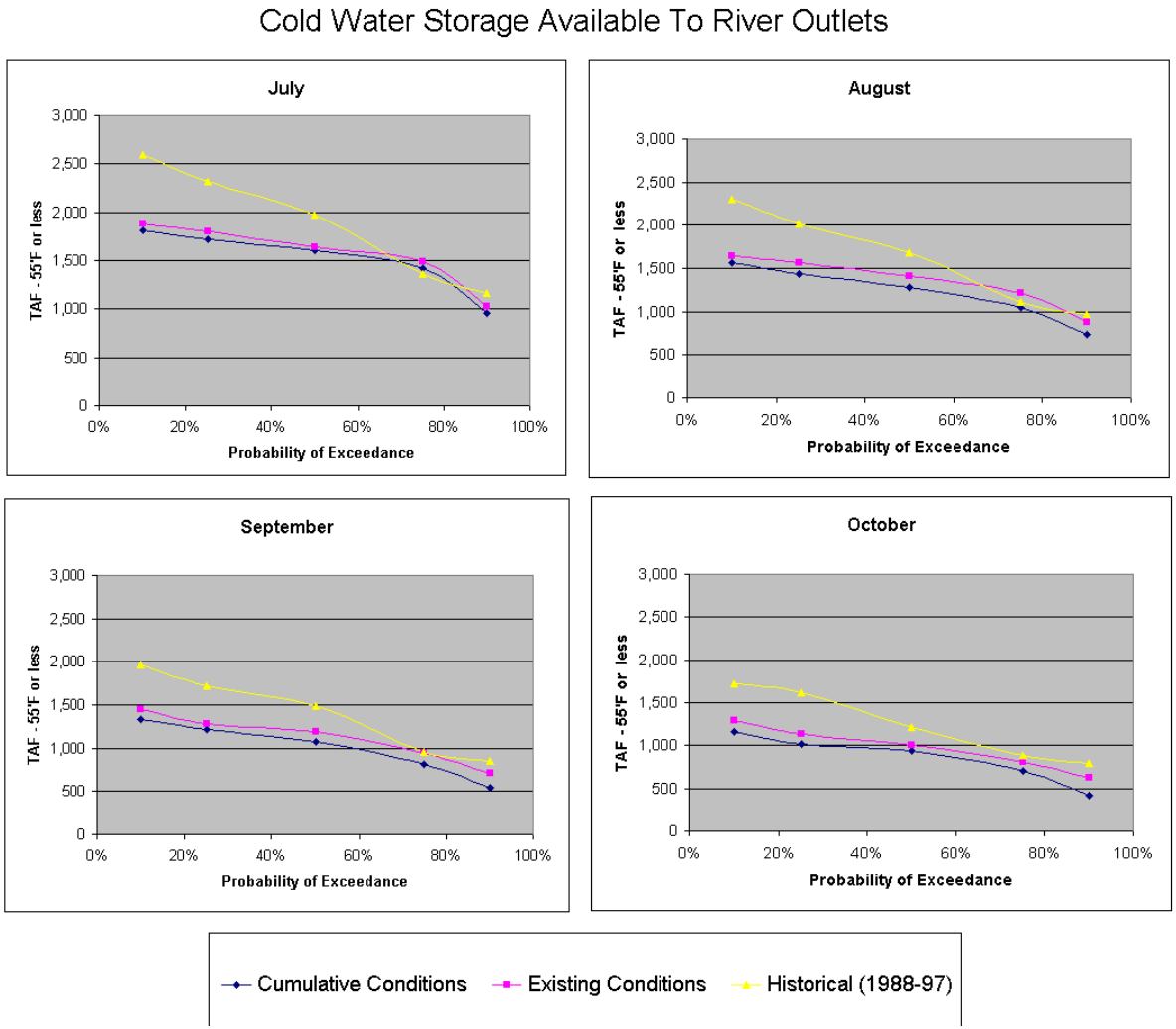
Analysis Presentation

- Exceedance curves of volume of 55F or colder water above power outlets (652 ft surface elevation)
- Exceedance curves of volume of 55F or colder water above river outlets

Cold Water At Power Outlet

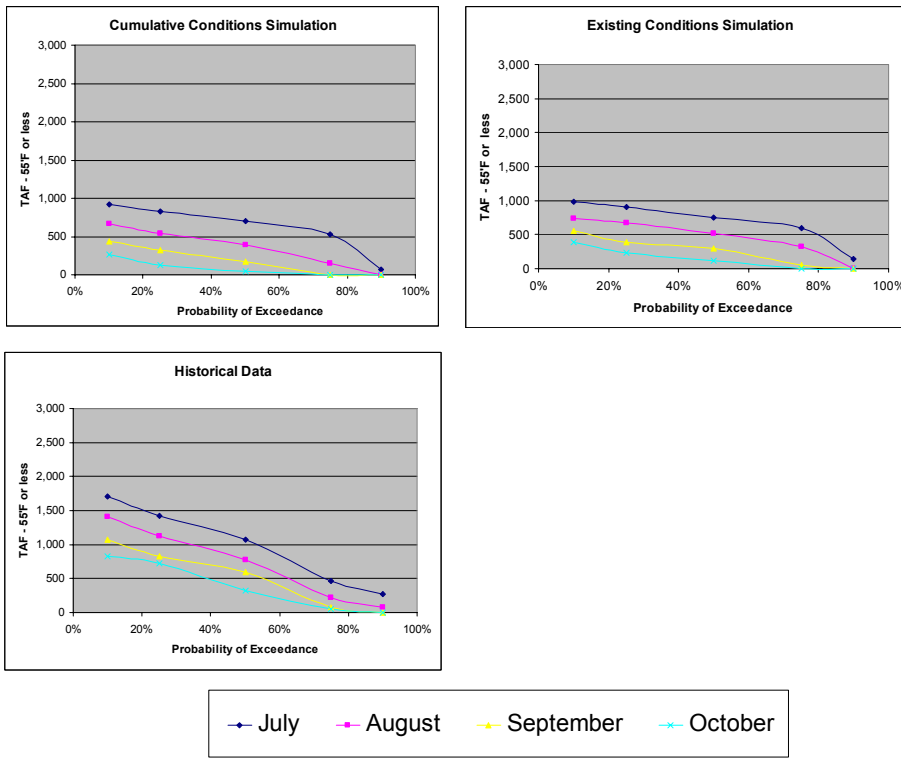


Cold Water At River Outlet

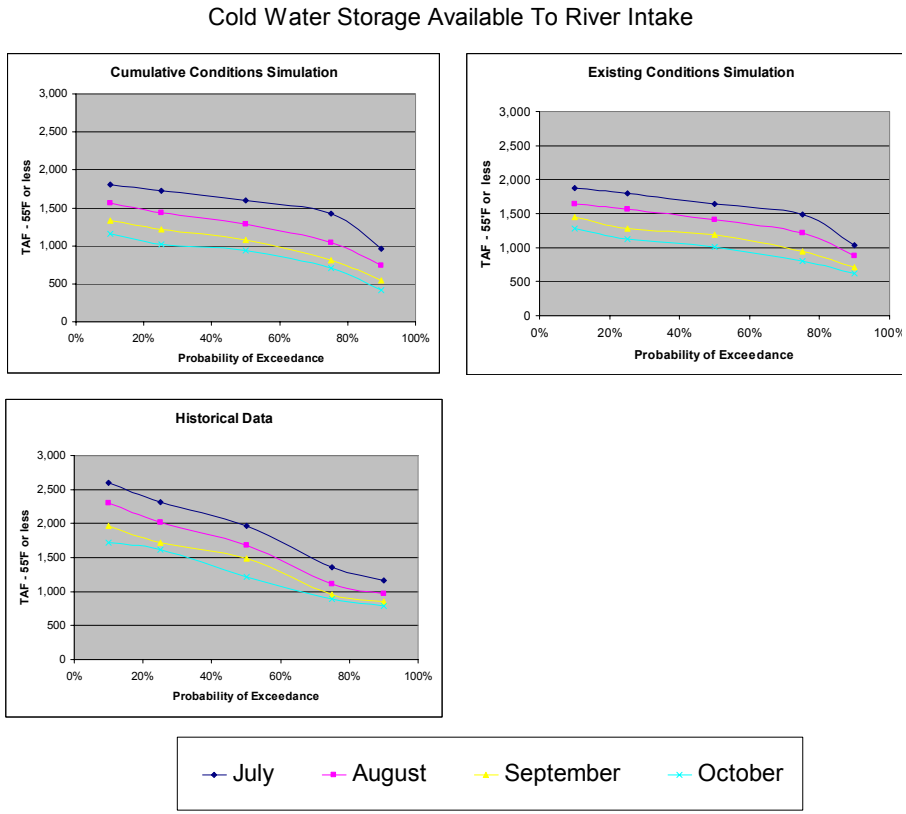


Cold Water At Power Outlet

Cold Water Storage Available To Power Intake



Cold Water At River Outlet



River Outlet Release

Average Annual Lake Oroville Release Through River Outlets (TAF)

	Release When Elevation Below 652 Feet	Release for Temperature Objectives	Total Release Through River Outlets	Total Reservoir Release
Exisiting Conditions Simulation	12.0	45.0	57.0	3,979
Cumulative Condition Simulation	69.5	42.8	112.3	3,983